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Serial No.:	09/589,974
Filed:	June 8, 2000
Group Art Unit:	2616
Title:	ARCHITECTURE OF INTERNET PROTOCOL-BASED CELLULAR NETWORKS
Our Ref. No.:	G&C 139.132-US-U1

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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In re Application of:

Inventor: David J. Y. Lee et al.

Serial #: 09/589,974

Filed: June 8, 2000

Title: ARCHITECTURE OF INTERNET PROTOCOL-BASED CELLULAR NETWORKS

Examiner: Daniel J. Ryman

Group Art Unit: 2616

Appeal No.: _____

BRIEF OF APPELLANTS

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In accordance with 37 CFR §41.37, Appellants' attorney hereby submits the Brief of Appellants on appeal from the final rejection in the above-identified application as set forth in the Office Action dated March 16, 2007.

Because this is a reinstatement, no further fee is due at this time. Nonetheless, please charge any additional fees or credit any overpayments to Deposit Account No. 50-0494 of Gates & Cooper LLP.

I. REAL PARTY IN INTEREST

The real party in interest is Cellco Partnership, the assignee of the present application.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

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III. STATUS OF CLAIMS

Claims 1-12 are pending in the application.

Claims 1, 2, 5, 6, and 9-12 were rejected under 35 U.S.C. §102(e) as being anticipated by Frid et al., U.S. Patent No. 6,137,791 (Frid).

Claims 3, 4, 7, and 8 were rejected under 35 U.S.C. §103(a) as being rendered obvious by Frid as applied to claims 1 and 6, and further by Olkkonen, WO 98/43456 (Olkkonen).

Claims 1-12 are being appealed.

IV. STATUS OF AMENDMENTS

No amendments have been made subsequent to the final Office Action.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Appellants' independent claim 1 is directed to an internet protocol-based cellular telephone communications system. (See page 1, lines 11-12 and page 3, lines 3-6.) The internet protocol-based cellular telephone communications system includes: a router (404); a foreign agent (FA) (406) coupled to the router (404); and a base transceiver station (BTS) (408, 410, 412) coupled to the router (404) for communicating with a mobile telephone (414) within a transmission area associated with the base transceiver station (408, 410, 412). (See page 11, line 20 through page 12, line 19 referring to 404, 406, 408, 410, 412 and 414 in FIG. 4; page 13, lines 2-18 referring to 404, 406, 408, 410, 412 and 414 in FIG. 5; and page 13, line 21 through page 14, line 14 referring to 404, 406, 408, 410, 412 and 414 in FIG. 6.) The router (404) communicates with the base transceiver station (408, 410, 412) using a cellular network interface; and a home agent (HA) (420), coupled to the router (404), wherein the home agent (420) communicates with the router (404) and the foreign agent (406) for registering mobile telephones (414) and transmitting messages using an internet-protocol network separate from the cellular network. (See page 11, line 20 through page 12, line 19 referring to 404, 406, 408, 410, 412 and 414 in FIG. 4; page 13, lines 2-18 referring to 404, 406, 408, 410, 412 and 414 in FIG. 5; and page 13, line 21 through page 14, line 14 referring to 404, 406, 408, 410, 412 and 414 in FIG. 6.) Messages are transmitted using the internet protocol network between the home agent

PAGE 5/20 * RCVD AT 8/15/2007 5:24:34 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-3/1 * DNIS:2738300 * CSID:+13106418798 * DURATION (mm-ss):05-00

(420) and the router (404), and messages are transmitted using the cellular network interface between the router (404) and the base transceiver station (408, 410, 412). (See page 11, line 20 through page 12, line 19 referring to 404, 406, 408, 410, 412 and 414 in FIG. 4; page 13, lines 2-18 referring to 404, 406, 408, 410, 412 and 414 in FIG. 5; and page 13, line 21 through page 14, line 14 referring to 404, 406, 408, 410, 412 and 414 in FIG. 6.)

Appellants' independent claim 6 is directed to an internet protocol-based cellular telephone communications system. (See page 1, lines 11-12 and page 3, lines 3-6.) The internet protocol-based cellular telephone communications system includes: a handoff server (HS) (702); a base transceiver station (BTS) (408, 410, 412), coupled to the handoff server (702), for communicating with a mobile telephone (414) within a transmission area associated with the base transceiver station (408, 410, 412), wherein the handoff server (702) communicates with the base transceiver station (408, 410, 412) using a cellular network interface; and a home agent (HA) (420), coupled to the handoff server (702). (See page 3, lines 3-16; page 14, line 17 through page 15, line 13 referring to 408, 410, 412, 414 and 702 in FIG. 7; page 15, lines 14-21 referring to 408, 410, 412, 414 and 702 in FIG. 8; and 420 shown in both FIGS. 7 and 8.) The home agent (420) communicates with the handoff server (702) for transmitting messages using an internet-protocol network separate from the cellular network. (See 420 and 702 in FIGS. 7 and 8.) Messages are transmitted using the internet protocol network between the home agent (420) and the handoff server (702), and messages are transmitted using the cellular network interface between the handoff server (702) and the base transceiver station (408, 410, 412). (See page 14, line 17 through page 15, line 13 referring to 408, 410, 412, 414 and 702 in FIG. 7; page 15, lines 14-21 referring to 408, 410, 412, 414 and 702 in FIG. 8; and 420 and 702 shown in both FIGS. 7 and 8.)

Appellants' independent claim 12 is directed to a method for communicating over an internet protocol-based communications network. (See page 1, lines 11-12 and page 3, lines 3-6.) A message is sent from a home agent (HA) (420) to a router (406) over an internet protocol based network. (See page 11, line 20 through page 12, line 19 referring to 404, 406, 408, 410, 412 and 414 in FIG. 4; page 13, lines 2-18 referring to 404, 406, 408, 410, 412 and 414 in FIG. 5; and page 13, line 21 through page 14, line 14 referring to 404, 406, 408, 410, 412 and 414 in

PAGE 6/20 * RCVD AT 8/15/2007 5:24:34 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-3/1 * DNIS:2738300 * CSID:+13106418798 * DURATION (mm-ss):05-00

FIG. 6.) The message is forwarded from the router (406) to a base transceiver station (BTS) (408, 410, 412) using a cellular network interface, wherein the cellular network is not part of the internet protocol based network. (See page 11, line 20 through page 12, line 19 referring to 404, 406, 408, 410, 412 and 414 in FIG. 4; page 13, lines 2-18 referring to 404, 406, 408, 410, 412 and 414 in FIG. 5; and page 13, line 21 through page 14, line 14 referring to 404, 406, 408, 410, 412 and 414 in FIG. 6.) The message is forwarded from the base transceiver station (408, 410, 412) to a mobile telephone (414) that is within a geographical communications zone of the base transceiver station (408, 410, 412). (See page 11, line 20 through page 12, line 19 referring to 404, 406, 408, 410, 412 and 414 in FIG. 4; page 13, lines 2-18 referring to 404, 406, 408, 410, 412 and 414 in FIG. 5; and page 13, line 21 through page 14, line 14 referring to 404, 406, 408, 410, 412 and 414 in FIG. 6.)

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether claims 1, 2, 5, 6, and 9-12 are unpatentable under 35 U.S.C. §102(e) as being anticipated by Frid et al., U.S. Patent No. 6,137,791 (Frid).

2. Whether claims 3, 4, 7, and 8 are unpatentable under 35 U.S.C. §103(a) as being rendered obvious by Frid as applied to claims 1 and 6, and further in view of Olkkonen, WO 98/43456 (Olkkonen).

VII. ARGUMENT

As noted above, claims 1, 2, 5, 6, and 9-12 were rejected under 35 U.S.C. §102(e) as being anticipated by Frid, U.S. Patent No. 6,137,791, while claims 3, 4, 7, and 8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Frid, and further in view of Olkkonen, PCT Published Application No. WO 98/43456.

Appellants' attorney respectfully traverses these rejections. Appellants' attorney respectfully submits that Appellants' claimed invention is patentable over the cited references. Specifically, Appellants' attorney asserts that the references, taken individually or in combination, do not teach or suggest the specific combination of elements recited in Appellants' claims.

PAGE 7/20 * RCVD AT 8/15/2007 5:24:34 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-3/1 * DNIS:2738300 * CSID:+13106418798 * DURATION (mm-ss):05-00

A. Arguments Directed To The First Grounds for Rejection: Whether claims 1, 2, 5, 6, and 9-12 are anticipated under 35 U.S.C. §102(e) by Frid, U.S. Patent No. 6,137,791.

1. *Frid does not disclose messages being transmitted between a home agent, a router and a foreign agent using an IP network separate from the cellular network*

With regard to Appellants' independent claims 1 and 12, the Office Action asserts that the visited mobile switching center (VMSC) of Frid is a router and the VMSC of Frid communicates with the base transceiver station (BTS) using a cellular interface. In addition, the Office Action asserts that Frid discloses a foreign agent (FA), coupled to the router, and a home agent (HA), coupled to the router, wherein the home agent communicates with the router and the foreign agent for registering mobile telephones and transmitting messages using an internet-protocol network separate from the cellular network; wherein messages are transmitted using the internet protocol network between the home agent and the router. Finally, the Office Action asserts that Frid teaches a home agent communicating with the router and a foreign agent for registering mobile telephones and transmitting messages using an internet-protocol network separate from the cellular network.

Appellants' attorney disagrees.

Consider the locations in Frid cited by the Office Action as teaching all the limitations of Appellants' claims:

> Frid: col. 4, lines 15-53
>
> A plurality of base stations (BSs) 30 provide radio coverage over a plurality of geographic areas. A particular BS 30 then connects to an associated visited mobile switching center (VMSC) 40 for routing and processing communicated data. In case the communicated data is normal voice data, the VMSC 40 communicates with an associated backbone network 15 to communicate the voice data with a specified destination terminal. On the other hand, in case the communicated data represent Internet Protocol (IP) data or packet data, the VMSC 40 instead communicates with a visited packet mobile switching center (VPMSC) 80. The VPMSC 80 then communicates with the

PAGE 8/20 * RCVD AT 8/15/2007 5:24:34 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-3/1 * DNIS:2738300 * CSID:+13106418798 * DURATION (mm-ss):05-00

associated backbone network 15 to communicate with a specified destination node.

Whenever a particular mobile station travels into a particular geographic area, a base station (BS) 30 serving that geographic area transmits identification data informing the mobile station of the current location. Utilizing such identification data, the mobile station 20 realizes that it has traveled into a new geographic area being covered by a new visited mobile switching center (VMSC) 40 and performs a registration. Therefore, an associated mobile identification number (MIN, such as a Mobile Subscriber Integrated Service Digital Network--MSISDN number, International Mobile Subscriber Identity--IMSI number, etc.,) is transmitted to the serving base station 30. The serving base station 30, in turn, forwards the received registration request to the VMSC 40 serving that geographic area. Utilizing the received mobile identification number, the VMSC 40 then identifies a home location register (HLR) 50 associated with the mobile station 20. The HLR 50 is a centralized database associated with the home network for storing subscription data representing the mobile station 20 and for maintaining location data reflecting the mobile station's current location and registration status. Furthermore, the HLR SO associated with the PMM network further stores data correlating the received mobile identification number with a corresponding Internet Protocol (IP) address assigned to the mobile station 20.

PAGE 9/20 * RCVD AT 8/15/2007 5:24:34 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-3/1 * DNIS:2738300 * CSID:+13106418798 * DURATION (mm-ss):05-00

Frid: FIG. 3

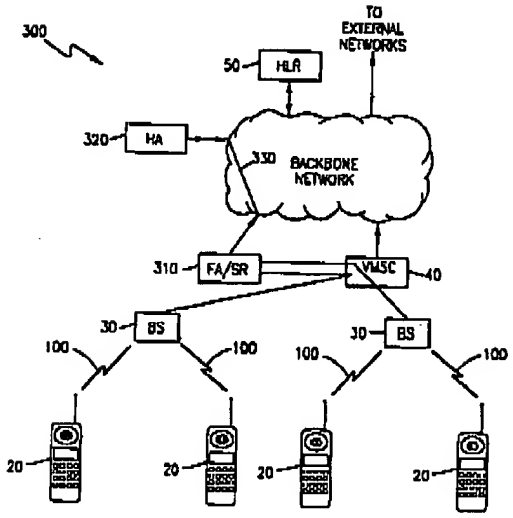

FIG. 3

Frid: col. 7, line 5 – col. 8, line 12

The serving MIM network itself is not able to initiate a data session with an associated mobile station. As a result, in order to communicate IP packets or data, the serving MIM network needs to wait until the mobile station 20 first initiates a data session. The mobile station 20 initiates a data session by requesting packet data communication with the serving BS 30. The BS 30 then forwards the request through the serving VMSC 40 to an associated foreign agent and serving router (FA/SR) 310. The FA/SR 310 then analyzes the IP address transmitted by the traveling mobile station 20 and determines a home agent 320 associated therewith. The HA 320 is a packet data communication node for keeping track of the mobile station's current location and for performing gateway function for

PAGE 10/20 * RCVD AT 8/15/2007 5:24:34 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-3/1 * DNIS:2738300 * CSID:+13106418798 * DURATION (mm-ss):05-00

receiving and routing incoming packet data. The FA 310 then communicates with the identified HA 320 to establish an IP tunnel 330 therebetween.

Incoming packet data addressed to the IP address associated with the mobile station 20 are first delivered to the HA 320 associated to the mobile station 20. The HA 320 then reroutes the received packet data to the connected FA/SR 310 by similarly encapsulating the received IP packet within another IP packet addressed to the FA/SR 310. The encapsulated IP packet is then transmitted over the established IP tunnel 330. The FA/SR 310 then extracts the original packet data from the received IP packet and forwards the extracted data through the serving VMSC 40 to the mobile station 20 by way of radio-interface 100 as described above.

As illustrated above, the only mobile telecommunications nodes utilized for effectuating the communication of packet data with a mobile station are the VMSC 40 and base station 30 serving that particular geographic area. Accordingly, the VMSC 40 and BS 30 are used as the very last leg of the communication link to deliver packet data via over-the-air interface 100 toward the mobile station 20. Mobility management (MM) for maintaining the current location of a mobile station 20 and for rerouting packet data to the traveling mobile station 20 are performed via separate packet data communications nodes, such as a home agent (HA) and a foreign agent (FA).

Reference is now made to FIG. 4 illustrating the handover of a mobile station 20 within an MIM network. As described above, the mobile station 20 traveling within a particular geographic area requests packet communication by transmitting a packet communication request 400 towards the serving BS1 30. The BS1 30 relays the request 410 to the connected VMSC1 40. The VMSC1 40 determines that this request is associated with packet data communication and establishes an IP communication link 420 with the foreign agent/serving router (FA/SR1) 310 serving that particular geographic area. As a result, a Point-to-Point Protocol (PPP) connection is established between the mobile station 20 and the FA/SRI 310. The FA/SRI 310 then communicates with a home agent (HA) 320 associated with the traveling mobile station 20 and effectuates an IP tunnel 440 therebetween. Packet data delivery 450 over the IP tunnel 440 is thereafter effectuated.

When the mobile station 20 travels out of the current geographic area being served by the VMSC1 40 and travels into a new geographic area being served by a new VMSC2 45, the mobile station again requests a new packet communication request 460 to a BS2 35 currently providing radio coverage over the new geographic area. The BS2 35 similarly forwards the request 470 to the VMSC2 45 serving that particular geographic area. The VMSC2 45 then establishes a link with an associated FA/SR2 315. Accordingly, a new PPP connection 480 is established between the mobile station 20 and the new FA/SR2 315. The FA/SR2 315 then contacts the HA 320 associated with the mobile station and establishes a new IP tunnel 500 therebetween. Subsequently received incoming packet data 510 are then delivered to the VMSC2 45 via the new IP

PAGE 11/20 * RCVD AT 8/15/2007 5:24:34 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-3/1 * DNIS:2738300 * CSID:+13106418798 * DURATION (mm-ss):05-00

tunnel 500. As a result, the mobile station 20 is handed over from the VMSC1 40 and FA/SR1 310 to the new VMSC2 45 and FA/SR2 315.

Appellants' attorney first notes that the VMSC (Visited Mobile Switching Center) of Frid is not a router, as defined in Appellants' specification. Instead, Appellants' invention removes the MSC from the architecture, and replaces the BSC (Base Station Controller) with a router that interfaces to the BTS (Base Station Transceiver). See, e.g., Appellants' specification at page 11, lines 21-23.

Moreover, Frid states, in conjunction with FIG. 3, that each VMSC 40 is associated with a foreign agent (FA) 310, wherein the FA 310 is equipped with a serving router (SR) for routing packet data to the appropriate destination nodes. Consequently, the routing function in Frid is performed by the FA/SR 310, not the VMSC 40.

In addition, as shown in FIG. 3 of Frid, communication occurs directly between the VMSC 40 and FA/SR 310, without traversing the backbone network. The FA/SR 310 of Frid then communicates with a home agent (HA) 320 by means of an IP tunnel 330 through the backbone network.

However, there is no indication that the VMSC 40 is coupled to or communicates directly with the HA 320 through the backbone network. Instead, there is only communication between the FA/SR 310 and HA 320 through the backbone network, with the FA/SR 310 forwarding the data to the VMSC 40. Consequently, there is no need for the VMSC 40 in Frid to include a routing function.

2. *Frid does not disclose messages being transmitted between a home agent and a handoff server using an IP network separate from the cellular network*

A similar argument can be made with regards to Appellants' independent claim 6.

The Office Action asserts that Frid discloses each limitation of claim 6, as outlined in the rejection of claims 1 and 12, except that the Office Action also asserts that the VMSC of Frid is a "handoff server."

Appellants' attorney disagrees.

PAGE 12/20 * RCVD AT 8/15/2007 5:24:34 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-3/1 * DNIS:2738300 * CSID:+13106418798 * DURATION (mm-ss):05-00

Appellants' attorney notes that the VMSC of Frid is not a handoff server, as defined in Appellants' specification. As noted above, Appellants' invention removes the VMSC from the architecture, and replaces the BSC (Base Station Controller) with a router that interfaces to the BTS (Base Station Transceiver). See, e.g., Appellants' specification at page 11, lines 21-23. In another embodiment, the hand-off server as a replacement for the router in Appellants' invention. See, e.g., Appellants' specification at page 14, lines 17-18.

Moreover, Frid states, in conjunction with FIG. 3, that each VMSC 40 is associated with a foreign agent (FA) 310, wherein the FA 310 is equipped with a serving router (SR) for routing packet data to the appropriate destination nodes. Consequently, the routing function in Frid is performed by the FA/SR 310, not the VMSC 40.

In addition, as shown in FIG. 3 of Frid, communication occurs directly between the VMSC 40 and FA/SR 310, without traversing the backbone network. The FA/SR 310 of Frid then communicates with a home agent (HA) 320 by means of an IP tunnel 330 through the backbone network.

However, there is no indication that the VMSC 40 of Frid is coupled to or communicates directly with the HA 320 through the backbone network. Instead, in Frid, there is only communication between the FA/SR 310 and HA 320 through the backbone network, with the FA/SR 310 forwarding the data to the VMSC 40. Consequently, there is no need for the VMSC 40 in Frid to include a routing function.

3. *Summary*

Thus, Appellants' attorney submits that independent claims 1, 6, and 12 are allowable over the Frid reference. Further, dependent claims 2, 5 and 9-11 are submitted to be allowable over the Frid reference in the same manner, because they are dependent on independent claims 1, 6, and 12, respectively, and thus contain all the limitations of the independent claims.

PAGE 13/20 * RCVD AT 8/15/2007 5:24:34 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-3/1 * DNIS:2738300 * CSID:+13106418798 * DURATION (mm-ss):05-00

B. Arguments Directed To The Second Grounds for Rejection: Whether claims 3, 4, 7, and 8 are obvious under 35 U.S.C. §103(a) as being unpatentable over Frid, U.S. Patent No. 6,137,791, and further in view of Olkkonen, PCT Published Application No. WO 98/43456.

1. *Olkkonen does not overcome the deficiencies of Frid*

Olkkonen does not overcome these deficiencies of Frid. Recall that Olkkonen was cited only against Appellants' dependent claims 3, 4, 7 and 8, and only for teaching the use of ATM in cellular telephony. Thus, even when combined, Frid and Olkkonen do not teach all the elements of Appellants' independent claims. As a result, Appellants' attorney submits that dependent claims 3, 4, 7 and 8 are allowable over the references in the same manner, because they are dependent on independent claims 1 and 6, respectively, and thus contain all the limitations of the independent claims.

VIII. CONCLUSION

In light of the above arguments, Appellants' attorney respectfully submits that the cited references do not anticipate nor render obvious the claimed invention. More specifically, Appellants' claims recite novel physical features which patentably distinguish over any and all references under 35 U.S.C. §§ 102 and 103.

PAGE 14/20 * RCVD AT 8/15/2007 5:24:34 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-3/1 * DNIS:2738300 * CSID:+13106418798 * DURATION (mm-ss):05-00

As a result, a decision by the Board of Patent Appeals and Interferences reversing the Examiner and directing allowance of the pending claims in the subject application is respectfully solicited.

Respectfully submitted,

GATES & COOPER LLP
Attorneys for Appellants

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CLAIMS APPENDIX

1. (PREVIOUSLY PRESENTED) An internet protocol-based cellular telephone communications system, comprising:

a router;

a foreign agent (FA), coupled to the router;

a base transceiver station (BTS), coupled to the router, for communicating with a mobile telephone within a transmission area associated with the base transceiver station, wherein the router communicates with the base transceiver station using a cellular network interface; and

a home agent (HA), coupled to the router, wherein the home agent communicates with the router and the foreign agent for registering mobile telephones and transmitting messages using an internet-protocol network separate from the cellular network;

wherein messages are transmitted using the internet protocol network between the home agent and the router, and messages are transmitted using the cellular network interface between the router and the base transceiver station.

2. (ORIGINAL) The cellular telephone communications system of claim 1, further comprising a second BTS, wherein a handoff between the BTS and the second BTS is performed through the internet protocol network.

3. (ORIGINAL) The cellular telephone communications system of claim 2, wherein a soft hand off (SHO) is performed between the BTS and the second BTS using asynchronous transfer mode (ATM) communications between the router and the BTS and the router and the second BTS.

4. (ORIGINAL) The cellular telephone system of claim 3, wherein the SHO is performed using ATM between the BTS and the second BTS and the mobile telephone.

5. (ORIGINAL) The cellular telephone communications system of claim 1, wherein the HA directs a message to the mobile telephone using an internet protocol address.

PAGE 16/20 * RCVD AT 8/15/2007 5:24:34 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-3/1 * DNIS:2738300 * CSID:+13106418798 * DURATION (mm-ss):05-00

6. (PREVIOUSLY PRESENTED) An internet protocol-based cellular telephone communications system, comprising:

a handoff server (HS);

a base transceiver station (BTS), coupled to the handoff server, for communicating with a mobile telephone within a transmission area associated with the base transceiver station, wherein the handoff server communicates with the base transceiver station using a cellular network interface; and

a home agent (HA), coupled to the handoff server, wherein the home agent communicates with the handoff server for transmitting messages using an internet-protocol network separate from the cellular network;

wherein messages are transmitted using the internet protocol network between the home agent and the handoff server, and messages are transmitted using the cellular network interface between the handoff server and the base transceiver station.

7. (PREVIOUSLY PRESENTED) The cellular telephone communications system of claim 6, wherein the cellular network interface is asynchronous transfer mode (ATM).

8. (ORIGINAL) The cellular telephone communications system of claim 6, wherein the BTS communicates with the mobile telephone using asynchronous transfer mode (ATM).

9. (ORIGINAL) The cellular telephone communications system of claim 6, wherein a handoff of a mobile telephone between the BTS and a second BTS within the cellular telephone communications system is handled through the handoff server.

10. (ORIGINAL) The cellular telephone communications system of claim 9, wherein the mobile telephone communicates directly through the handoff server during the handoff between the BTS and the second BTS.

11. (ORIGINAL) The cellular telephone communications system of claim 6, wherein a handoff between the BTS and a second BTS is anchored through the first BTS until updates can be made at the HA.

PAGE 17/20 * RCVD AT 8/15/2007 5:24:34 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-3/1 * DNIS:2738300 * CSID:+13106418798 * DURATION (mm-ss):05-00

12. (PREVIOUSLY PRESENTED) A method for communicating over an internet protocol-based communications network, comprising:

sending a message from a home agent (HA) to a router over an internet protocol based network;

forwarding the message from the router to a base transceiver station (BTS) using a cellular network interface, wherein the cellular network is not part of the internet protocol based network; and

forwarding the message from the base transceiver station to a mobile telephone that is within a geographical communications zone of the base transceiver station.

PAGE 18/20 * RCVD AT 8/15/2007 5:24:34 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-3/1 * DNIS:2738300 * CSID:+13106418798 * DURATION (mm-ss):05-00

EVIDENCE APPENDIX

None.

PAGE 19/20 * RCVD AT 8/15/2007 5:24:34 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-3/1 * DNIS:2738300 * CSID:+13106418798 * DURATION (mm-ss):05-00

RELATED PROCEEDINGS APPENDIX

None.

PAGE 20/20 * RCVD AT 8/15/2007 5:24:34 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-3/1 * DNIS:2738300 * CSID:+13106418798 * DURATION (mm-ss):05-00